

Problem Solving and Quadratic Functions

Maximum and Minimum Problems (pg. 555 - 558)

To find the minimum or maximum find the vertex of the parabola.

Example 1:

After the admission fee was dropped, attendance at the Museum of Art began to rise after several years of decline. The number of museum admissions, in thousands, t years after 2000 can be approximated by $m(t)$ where $m(t) = 32t^2 - 320t + 975$. In what year was the museum attendance the lowest and how many people went to the museum that year?

Example 2:

A lifeguard has 100 m of roped-together flotation devices with which to cordon off a rectangular swimming area at North Beach. If the shoreline forms one side of the rectangle, what dimensions will maximize the size of the area for swimming?

Example 3:

As more listeners download their music purchases, sales of compact discs are decreasing. According to Nielsen Sound Scan, sales of music CD's increased from 500 million in 1997 to 700 million in 2001 and then decreased to 450 million in 2007. As the graph suggest, sales of music CD's can be modeled by a quadratic function.

- Let t represent the number of years since 1997 and $S(t)$ the total number of CD's sold, in millions. Use the data points (0,500), (4,700) and (10,450) to find a quadratic function that fits the data.
- Use the function from part (a) to estimate the sales of music CD's in 2009.